Patent claims

1. A joint-site structure for a shaft/hub composite workpiece, in particular for joining the shaft (1) to a connection flange (2) of a hub part by means of friction welding, characterized in that a respective defined gap (4, 4') is incorporated between the shaft (1) and the connection flange (2) of the hub part in front of and behind a joint site (3), this gap (4, 4') preventing the spread of the material softened during the friction welding.

2. The joint-site structure as claimed in claim 1, characterized in that the height (10, 10') of the gap (4, 4') is dimensioned in such a way that the composite workpiece has a widened bonding zone (8) in front of and behind the joint site (3).

3. The joint-site structure as claimed in claim 2, characterized in that, at a friction length of 6 mm and a gap distance of 1.5 mm, the bonding zone (8) has an axial extent of 10 mm.

4. The joint-site structure as claimed in one of the preceding claims, characterized in that the hub part has a two-step connection flange (2) which has no undercuts.

5. The joint-site structure as claimed in one of the preceding claims, characterized in that the shaft (1) has undercuts (9, 9', 9'').

6. The joint-site structure as claimed in one of the preceding claims, characterized in that the shaft (1) and hub part are made of different materials.

7. The joint-site structure as claimed in claim 11, characterized in that the components (1, 2) to be joined have a radial overlap (5) which is in the region of 1.5 to 2.5 mm.

8. The use of a joint-site structure as claimed in one of the preceding claims, characterized in that a crankshaft is joined to a drive wheel.

9. A method of joining a shaft (1), in particular a crankshaft for a motor vehicle, to a connection flange (2) of a hub part of a drive wheel, characterized in that a respective defined gap (4, 4') is incorporated between shaft (1) and connection flange (2) in front of and behind a joint site (3), this gap (4, 4') preventing the spread of the material softened during the subsequent joining of shaft (1) and connection flange (2) by friction welding.

10. The method as claimed in claim 9, characterized in that the drive wheel is cooled during the friction welding.

11. The method as claimed in claim 9 or 10, characterized in that the hub part is produced without undercuts, and in that the undercuts (9, 9', 9'') required for forming a 2-step connection flange (2) are produced on the shaft (1).

12. The method as claimed in one of claims 9 to 11, characterized in that a stepped tool is used for producing the hub part, and in that the internal machining of the hub is carried out in one process step.